

## FOLDABLE CHAIR FRAME

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

5 The present invention relates to a foldable chair frame, more particularly to a foldable chair frame with a relatively simple structure.

#### 2. Description of the Related Art

10 Foldable chairs with backrests are known in the art. The conventional foldable chair of this type generally includes a backrest frame, a seat frame pivoted to the backrest frame, and front and rear legs pivoted to the seat frame and the backrest frame and further pivoted to each other. When the chair is folded, the seat frame is usually folded on the backrest frame, and the front and rear legs are folded on the seat frame. The conventional foldable chair as such occupies a relatively large amount of storage space after folding.

### SUMMARY OF THE INVENTION

20 Therefore, the main object of the present invention is to provide a foldable chair frame with a relatively simple structure and a reduced thickness after folding.

25 Accordingly, the foldable chair frame of the present invention includes a front leg, a rear leg, an adjustable extension rod, and a seat frame. The front leg has a lower end portion adapted to be supported on a ground surface, a tubular upper end portion which extends upwardly and rearwardly from the lower end

portion and which confines an axial insert hole with a top opening, and an intermediate portion between the lower end portion and the tubular upper end portion. The upper end portion is formed with at least one radial positioning hole. The rear leg has a lower end portion adapted to be supported on the ground surface, an upper end portion which extends upwardly and forwardly from the lower end portion of the rear leg, and an intermediate portion connected pivotally to the intermediate portion of the front leg. The adjustable extension rod has a lower end portion extending into the axial insert hole in the upper end portion of the front leg via the top opening, and an upper end portion. The lower end portion of the extension rod is provided with a resilient positioning protrusion which projects radially into the positioning hole for engaging the positioning hole so as to position the lower end portion of the extension rod on the upper end portion of the front leg. The seat frame is disposed above the front and rear legs and the extension rod, and has a rear part connected pivotally to the upper end portion of the extension rod, and a front part connected pivotally to the upper end portion of the rear leg. The positioning protrusion is depressible for disengaging from the positioning hole to permit sliding movement of the extension rod relative to the front leg, thereby permitting the extension rod to retract into the upper

end portion of the front leg, and thereby permitting folding of the front and rear legs toward the seat frame.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

Figure 1 is a perspective view of a preferred embodiment of the foldable chair frame of the present invention;

Figure 2 is a side view of the preferred embodiment;

Figure 3 is a fragmentary exploded sectional view illustrating the connections between a connecting rod and a front leg and between the connecting rod and a seat frame;

Figure 4 is another side view of the preferred embodiment, illustrating the seat frame positioned at another inclination; and

Figure 5 is a top view showing the preferred embodiment in a folded state.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 to 3, the preferred embodiment of the foldable chair frame according to the present invention is shown to include a pair of front legs 12, a pair of rear legs 22, a pair of extension units 3, and a seat frame 4.

The front legs 12 are connected to each other at lower end portions thereof by means of a transverse front connecting rod 11 which is adapted to be disposed on a ground surface. Each of the front legs 12 extends upwardly and rearwardly from its lower end portion, and has a tubular upper end portion 125 which confines an axial insert hole 121 with a top opening 126. The upper end portion 125 of each of the front legs 12 is formed with a radial retaining hole 122 at a lateral outer side opposite to the other one of the front legs 12, and three radial positioning holes 123 at a lateral inner side facing the other one of the front legs 12. The positioning holes 123 are displaced from and are aligned with one another in an axial direction.

The rear legs 22 are connected to each other at lower end portions thereof by a transverse rear connecting rod 21 which is adapted to be disposed on the ground surface. Each of the rear legs 22 extends forwardly and upwardly from its lower end portion, and has an upper end portion formed with a pivot hole 221, and an intermediate portion which is disposed at the lateral outer side of a respective one of the front legs 12, and which is connected pivotally to the intermediate portion of the respective one of the front legs 12 by means of a horizontal pivot shaft 23.

Each of the extension units 3 includes an adjustable extension rod 31, a resilient positioning member 33 and

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a resilient retaining member 32. The extension rod 31 is tubular in shape, and confines an axial passage 312 therethrough. The extension rod 31 has an open lower end portion extending slidably into the upper end portion 125 of a respective one of the front legs 12 via the top opening 126, and an upper end portion formed with a pivot hole 313. The lower end portion of each of the extension rods 31 is formed with a radial first mounting hole 315 at a lateral inner side thereof for alignment with a selected one of the radial positioning holes 123 in the upper end portion 125 of a respective one of the front legs 12, and a radial second mounting hole 314 at a lateral outer side thereof for alignment with the radial retaining hole 122 in the upper end portion 125 of the respective one of the front legs 12.

The positioning member 33 and the retaining member 32 are retained resiliently in the axial passage 312 in the extension rod 31. Each of the positioning member 33 and the retaining member 32 includes a spring plate 331, 321 with two lateral plate portions which cooperatively form a generally V-shaped structure. The positioning member 33 has a positioning protrusion 332 formed on an outer side of one of the lateral plate portions thereof for projecting through the first mounting hole 315 in the extension rod 31. The retaining member 32 has a retaining protrusion 322 formed on an outer side of one of the lateral plate portions thereof

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for projecting through the second mounting hole 314 in the extension rod 31.

5 The seat frame 4 includes a generally annular frame portion 40 with front and rear parts. In other embodiments, the frame portion may be formed in other shapes, such as rectangular or oval. A pair of front pivot seats 41 and a pair of rear pivot seats 41' are welded to a bottom side of the frame portion 40 at two lateral sides of the front and rear parts of the frame portion 40. Each of the front and rear pivot seats 41, 10 41' has a parallel pair of downwardly extending pivot lobes 411. The upper end portion of each of the rear legs 22 extends between the pivot lobes 411 of a respective one the front pivot seats 41, and is connected pivotally to the front pivot seat 41 by means of a pivot pin 42 that extends transversely through the pivot lobes 411 and the pivot hole 221 in the upper end 15 portion of the respective rear leg 22. The upper end portion of each of the extension rods 31 extends between the pivot lobes 411 of a respective one of the rear pivot seats 41', and is connected pivotally to the rear pivot seat 41' by means of a pivot pin 43 that extends transversely through the pivot lobes 411 and the pivot hole 313 in the upper end portion of the respective 20 extension rod 31. A fabric piece 5 is mounted on the frame portion 40 of the seat frame 4 to form a seat.

After assembly, the front and rear legs 12, 22 cross each other, and the seat frame 4 is inclined in a manner that the rear part of the annular frame portion 40 is disposed at a higher position than the front part such that a backrest is provided by the fabric piece 5. The positioning protrusion 332 on each of the positioning members 33 projects through the first mounting hole 315 in a respective one of the extension rods 31, and projects into a selected one of the positioning holes 123 in a corresponding one of the front legs 12 for engaging the selected positioning hole 123, thereby positioning the extension rod 31 on the respective front leg 12. When the positioning member 33 in each of the extension rods 31 engages an uppermost one of the positioning holes 123 in the respective one of the front legs 12, the retaining protrusion 322 of each of the retaining members 32 projects into the retaining hole 122 in the upper end portion 125 of the respective front leg 12 for engaging the retaining hole 122. The retaining protrusions 322 help secure the extension rods 31 on the front legs 12 when the positioning protrusions 332 engage an uppermost pair of the positioning holes 123, where only a relatively short section of each of the extension rods 31 is disposed in the respective front leg 12.

Referring to Figures 3 and 4, to adjust the inclination of the seat frame 4, the retaining

protrusions 322 of the retaining members 32 are depressed for retracting into the second mounting holes 314 and for disengaging from the retaining holes 122, and the positioning protrusions 332 of the positioning members 33 are depressed for retracting into the first mounting holes 315 and for disengaging from the uppermost pair of the positioning holes 123, thereby permitting sliding movement of the extension rods 31 relative to the front legs 12 for adjustment of the inclination of the seat frame 4. After the seat frame 4 is adjusted to a desired inclination, the positioning protrusions 332 are released for engaging the selected positioning holes 123 so as to position the seat frame 4 at the adjusted inclination. It is noted that, the retaining protrusions 322 engage the retaining holes 122 only in the case the positioning protrusions 332 engage the uppermost pair of the positioning holes 123 to enhance strength of the connection between the lower end portions of the extension rods 31 and the upper end portions 125 of the front legs 12.

To fold the chair frame of the present embodiment, the positioning protrusions 332 are depressed for disengaging from the positioning holes 123 to permit sliding movement of the extension rods 31 relative to the front legs 12, thereby permitting retraction of the extension rods 31 into the upper end portion 125 of the front legs 12, in the case the positioning protrusions



332 engage the lowermost pair of the positioning holes 123 or the intermediate pair of the positioning holes 123. When the positioning protrusions 332 engage the uppermost pair of the positioning holes 123, both the positioning protrusions 332 and the retaining protrusions 322 are depressed to permit retraction of the extension rods 31 into the front legs 12. Thereafter, the front and rear legs 12, 22 are turned about the pivot shafts 23 in a manner that the front and rear connecting rods 11, 21 move away from each other, as shown in Figure 5, so as to fold the front and rear legs 12, 22 upon a bottom side of the seat frame 4.

Accordingly, with the provision of the extension units 3, the seat frame 4 of the chair frame of the present invention can be positioned at a desired inclination. The chair frame of the present invention has a relatively simple structure, and a reduced thickness after folding.

While the present invention has been described in connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.